

What is claimed is:

1. A method for generating a sheet metal model that can be unfolded automatically, from a solid model obtained
5 by modeling an outer shape of a sheet metal product in a three-dimensional sheet metal CAD/CAM system, the method comprising the steps of:

assigning entered attribution information including material and thickness of a sheet metal to a specified
10 solid model;

assigning entered designation information for designating an open plane and a bending portion to the solid model;

obtaining a minimum radius of curvature at the
15 bending portion from the material and the thickness of the sheet metal;

generating a downsized model defined by the designated open plane and a plurality of planes that are generated by moving a plurality of planes of the solid
20 model except the open plane inward in parallel by a distance that is a sum of the thickness of the sheet metal and the minimum radius of curvature;

generating inner wall surfaces by moving a plurality of surfaces of the downsized model except for the open
25 plane outward in parallel by a distance that is equal to the minimum radius of curvature;

generating plate portions by a projection process in which the inner wall surfaces are further moved outward in parallel by a distance that is equal to the thickness of
30 the sheet metal; and

generating a bending portion form that is a fillet connecting neighboring plate portions at the bending portion designated in the solid model.

2. The method according to claim 1, wherein a
5 thickness input box and a material selection pull-down menu are displayed as a screen display for entering the material and the thickness of the sheet metal, and an entered thickness value in the thickness input box is used as a key for searching a material master file so that one
10 or more found materials registered in connection with the entered thickness value are listed in the pull-down menu.

3. A sheet metal model generation device constituting a three-dimensional sheet metal CAD/CAM system, comprising:
15 a solid model generation portion for generating a solid model by modeling an outer shape of a sheet metal product;

an attribution information assigning portion for assigning entered attribution information including
20 material and thickness of a sheet metal to the solid model;

an open plane and bending portion designation portion for assigning entered designation information for designating an open plane and a bending portion to the
25 solid model;

a minimum radius of curvature obtaining portion for obtaining a minimum radius of curvature at the bending portion from the entered material and thickness of the sheet metal;

30 a downsized model generation portion for generating

a downsized model defined by the designated open plane and a plurality of planes that are generated by moving a plurality of planes of the solid model except the open plane inward in parallel by a distance that is a sum of
5 the thickness of the sheet metal and the minimum radius of curvature;

a plate portion generation portion for generating inner wall surfaces by moving a plurality of surfaces of the downsized model except for the open plane outward in
10 parallel by a distance that is equal to the minimum radius of curvature and for generating plate portions by a projection process in which the inner wall surfaces are further moved outward in parallel by a distance that is equal to the thickness of the sheet metal; and

15 a bending portion form generation portion for generating a bending portion form that is a fillet connecting neighboring plate portions at the bending portion designated in the solid model.

4. The sheet metal model generation device
20 according to claim 3, wherein the attribution information assigning portion makes a screen display of a thickness input box and a material selection pull-down menu, uses an entered thickness value in the thickness input box as a key for searching a material master file so that one or
25 more found materials registered in connection with the entered thickness value are listed in the pull-down menu.

5. A computer program product that is installed in a computer that constitutes a three-dimensional sheet metal CAD/CAM system for making the computer execute the
30 process for generating a sheet metal model including the

steps of:

assigning entered attribution information including material and thickness of a sheet metal to a specified solid model;

5 assigning entered designation information for designating an open plane and a bending portion to the solid model;

obtaining a minimum radius of curvature at the bending portion from the material and the thickness of the
10 sheet metal;

generating a downsized model defined by the designated open plane and a plurality of planes that are generated by moving a plurality of planes of the solid model except the open plane inward in parallel by a
15 distance that is a sum of the thickness of the sheet metal and the minimum radius of curvature;

generating inner wall surfaces by moving a plurality of surfaces of the downsized model except for the open plane outward in parallel by a distance that is equal to
20 the minimum radius of curvature;

generating plate portions by a projection process in which the inner wall surfaces are further moved outward in parallel by a distance that is equal to the thickness of the sheet metal; and

25 generating a bending portion form that is a fillet connecting neighboring plate portions at the bending portion designated in the solid model.

6. The computer program product according to claim 5, wherein a thickness input box and a material selection
30 pull-down menu are displayed as a screen display for

entering the material and the thickness of the sheet metal,
and an entered thickness value in the thickness input box
is used as a key for searching a material master file so
that one or more found materials registered in connection
5 with the entered thickness value are listed in the pull-
down menu.

7. A computer-readable storage medium storing a
computer program that is installed in a computer that
constitutes a three-dimensional sheet metal CAD/CAM system
10 for making the computer execute the process for generating
a sheet metal model including the steps of:

assigning entered attribution information including
material and thickness of a sheet metal to a specified
solid model;

15 assigning entered designation information for
designating an open plane and a bending portion to the
solid model;

obtaining a minimum radius of curvature at the
bending portion from the material and the thickness of the
20 sheet metal;

generating a downsized model defined by the
designated open plane and a plurality of planes that are
generated by moving a plurality of planes of the solid
model except the open plane inward in parallel by a
25 distance that is a sum of the thickness of the sheet metal
and the minimum radius of curvature;

generating inner wall surfaces by moving a plurality
of surfaces of the downsized model except for the open
plane outward in parallel by a distance that is equal to
30 the minimum radius of curvature;

generating plate portions by a projection process in which the inner wall surfaces are further moved outward in parallel by a distance that is equal to the thickness of the sheet metal; and

- 5 generating a bending portion form that is a fillet connecting neighboring plate portions at the bending portion designated in the solid model.